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Water Supply Outlook For Arizona



SOIL CONSERVATION SERVICE
U.S. DEPARTMENT OF AGRICULTURE

Cooperating with

SALT RIVER VALLEY WATER USERS ASSOCIATION
and ARIZONA WATER COMMISSION

AS OF
APR. 1, 1979

TO RECIPIENTS OF WATER SUPPLY OUTLOOK REPORTS:

Most of the usable water in western states originates as mountain snowfall. This snowfall accumulates during the winter and spring, several months before the snow melts and appears as streamflow. Since the runoff from precipitation as snow is delayed, estimates of snowmelt runoff can be made well in advance of its occurrence. Streamflow forecasts published in this report are based principally on measurement of the water equivalent of the mountain snowpack.

Forecasts become more accurate as more of the data affecting runoff are measured. All forecasts assume that climatic factors during the remainder of the snow accumulation and melt season will interact with a resultant average effect on runoff. Early season forecasts are therefore subject to a greater change than those made on later dates.

The snow course measurement is obtained by sampling snow depth and water equivalent at surveyed and marked locations in mountain areas. A total of about ten samples are taken at each location. The average of these are reported as snow depth and water equivalent. These measurements are repeated in the same location near the same dates each year.

Snow surveys are made monthly or semi-monthly from January 1 through June 1 in most states. There are about 1900 snow courses in Western United States and in the Columbia Basin in British Columbia. Networks of automatic snow water equivalent and related data sensing devices, along with radio telemetry are expanding and will provide a continuous record of snow water and other parameters at key locations.

Detailed data on snow course and soil moisture measurements are presented in state and local reports. Other data on reservoir storage, summaries of precipitation, current streamflow, and soil moisture conditions at valley elevations are also included. The report for Western United States presents a broad picture of water supply outlook conditions, including selected streamflow forecasts, summary of snow accumulation to date, and storage in larger reservoirs.

Snow survey and soil moisture data for the period of record are published by the Soil Conservation Service by states about every five years. Data for the current year is summarized in a West-wide basic data summary and published about October 1 of each year.

COVER PHOTO: VIEW OF A SNOTEL DATA SITE IN THE SNOWY RANGE IN WYOMING. TALL CYLINDRICAL DEVICE IS A PRECIPITATION GAGE. SNOW PILLOWS ON THE GROUND NOT VISIBLE DUE TO SNOW COVER. SHELTER HOUSE, ANTENNA TOWER, ANTENNA, AND TEMPERATURE UNIT ARE VISIBLE BEHIND THE PRECIPITATION GAGE.

PUBLISHED BY SOIL CONSERVATION SERVICE

The Soil Conservation Service publishes reports following the principal snow survey dates from January 1 through June 1 in cooperation with state water administrators, agricultural experiment stations and others. Copies of the reports for Western United States and all state reports may be obtained from Soil Conservation Service, West Technical Service Center, Room 510, 511 N.W. Broadway, Portland, Oregon 97209.

Copies of state and local reports may also be obtained from state offices of the Soil Conservation Service in the following states:

STATE	ADDRESS
Alaska	Room 129, 2221 East Northern Lights Blvd., Anchorage, Alaska 99504
Arizona	Room 3008, Federal Building, 230 N. First Ave., Phoenix, Arizona 85025
Colorado (N. Mex.)	P. O. Box 17107, Denver, Colorado 80217
Idaho	Room 345, 304 N. 8th. St., Boise, Idaho 83702
Montana	P. O. Box 98, Bozeman, Montana 59715
Nevada	P. O. Box 4850, Reno, Nevada 89505
Oregon	1220 S. W. Third Ave., Portland, Oregon 97204
Utah	4420 Federal Bldg., 125 South State St., Salt Lake City, Utah 84138
Washington	360 U. S. Court House, Spokane, Washington 99201
Wyoming	P. O. Box 2440, Casper, Wyoming 82602

PUBLISHED BY OTHER AGENCIES

Water Supply Outlook reports prepared by other agencies include a report for California by the Snow Surveys Branch, California Department of Water Resources, P.O. Box 388, Sacramento, California 95802 --- for British Columbia by the Ministry of the Environment, Water Investigations Branch, Parliament Buildings, Victoria, British Columbia V8V 1X5 --- for Yukon Territory by the Department of Indian and Northern Affairs, Northern Operations Branch, 200 Range Road, Whitehorse, Yukon Territory Y1A 3V1 --- and for Alberta, Saskatchewan, and N.W.T. by the Water Survey of Canada, Inland Waters Branch, 110-12 Avenue S.W., Calgary, Alberta T3C 1A6.



WATER SUPPLY OUTLOOK FOR ARIZONA

and
FEDERAL - STATE - PRIVATE COOPERATIVE SNOW SURVEYS

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Report prepared by

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Water from snowmelt irrigating cotton in central Arizona.

ARIZONA SUMMARY
as of
APRIL 1, 1979

THE WATER SUPPLY OUTLOOK IS EXCELLENT.

SNOW COVER

Snow cover decreased at the lower elevations, but continues to build above 7500 feet. Several snow courses in the White Mountains now have the heaviest snow cover in 30 years of record. The 14' of snow at the Mt. Ord site is the greatest depth ever measured in Arizona. Other areas of unusually heavy snow include the San Francisco Peaks, 10'; Sunrise Summit, 9' and Promontory Butte on the Rim, 7'. Although considerable melt occurred in late March, snow cover is still 2 to 3 times average for this date.

PRECIPITATION

March precipitation was much above average on all watersheds except the Gila which was near normal. Amounts of 4 to 5" occurred in the White Mountains and Flagstaff area, 6 to 9" along the Rim, and 1 to 2" in the Mogollon Mountains of New Mexico.

Accumulated precipitation since November 1 has been twice normal throughout the state. The heaviest precipitation occurred at Promontory Butte and Mt. Ord where 43" and 51" was received respectively.

SOIL MOISTURE

Due to the late March storms and melting snow, soils are extremely wet. High runoff yields are therefore expected both from April storms and the high elevation snowpack.

RESERVOIR STORAGE

All central Arizona storage reservoirs are close to capacity, but some available storage is still being maintained to absorb flows from future storms. As the probability of heavy storms decreases in late April, reservoirs will be allowed to fill to capacity. Painted Rock Dam, now 60% full, contains almost 1.5 million acre-feet. It will have no difficulty containing any additional inflow, but releases and innundation continue to cause trouble above and below this flood control reservoir. Record amounts of water are now contained in both Painted Rock and San Carlos Reservoir.

STREAMFLOW AND WATER SUPPLY

Much above normal runoff continued in March for the fifth consecutive month. Combining this flow with the April-May forecast results in the highest runoff since 1941 for the Gila River. The Salt, Verde and Tonto will produce three million acre-feet during this period, with 2.4 million having been received and .6 million expected in the next two months. Although the resulting damages and inconvenience has been far greater, this is not as much water as was received in 1973.

Water supplies will be plentiful this year with large amounts of carryover storage available for next year.

THIS IS THE FINAL REPORT OF THE SEASON

ABOUT APRIL
STREAMFLOW FORECASTS 1, 1979

STREAMFLOW FORECASTS		1, 1979		THIS YEAR		PAST RECORD	
BASIN, STREAM and/or FORECAST POINT		FORECAST		FORECAST PERIOD	THOUSAND ACRE FEET		
		Thousand Acre Feet	Percent of Average		Last Year	Average †	
<u>SALT RIVER DRAINAGE</u>							
Salt near Roosevelt		470	279	Apr-May	245.5	168.3	
"		300	277	April	180.8	103.8	
Tonto Creek near Roosevelt		45	349	Apr-May	13.4	12.9	
"		36	353	April	10.9	10.2	
Verde River above Horseshoe		130	157	Apr-May	51.3	82.6	
"		105	158	April	38.4	66.5	
Total Salt River Project Streams		645	245	Apr-May	310.2	263.8	
"		441	244	April	230.1	180.5	
<u>GILA RIVER DRAINAGE</u>							
Gila River at Calva		68	201	Apr-May	19.3	33.8	
Gila River near Gila		45	199	Apr-May	20.1	22.6	
Gila River near Solomon		110	216	Apr-May	49.1	51.0	
"		75	231	April	36.9	32.4	
Gila River near Virden		55	216	Apr-May	24.9	25.5	
Frisco River at Clifton 2/		60	211	Apr-May	21.7	28.4	
Frisco River at Glenwood 2/		30	210	Apr-May	10.1	14.3	
<u>LITTLE COLORADO RIVER DRAINAGE</u>							
Little Colo. River above Lyman Dam		37	416	Apr-June	6.3	8.9	
Greer 1/		18	286	Apr-June	---	6.3	
<u>GRANITE CREEK DRAINAGE</u>							
Granite Creek		1	---	Apr-May	---	---	
Willow Creek		0.3	---	Apr-May	---	---	
<u>MIMBRES RIVER DRAINAGE</u>							
Mimbres River near Mimbres		3	158	Apr-May	---	1.9	
<u>COLORADO RIVER DRAINAGE</u>							
Virgin River near Littlefield 2/		117	244	Apr-June	89.2	47.9	
Lake Mary Inflow		4	139	Apr-May	---	2.3	
1/ Includes Filler Ditch Diversion							
† Based on 15-year period, 1963-77							
* Average is for less than 15 years							
2/ Frisco & Virgin Rivers forecast prepared by National Weather Service							

1979

SPRING RUNOFF

1000's of Acre-Feet

Stream and Station	Measured <u>1</u> / Runoff Jan-March	Forecast Runoff April-May	Total-January thru May 1979	% of Average	Last Year
Salt River at Intake	672	470	1,142	331	1,003
Verde River above Horseshoe	469	130	599	267	857
Tonto Creek above Roosevelt	229	45	274	498	347
Total Salt River Proj.	1,370	645	2,015	286	2,207
Gila River near Virden	192	55	247	313	127
Gila River near Solomon	518	110	628	403	284
Gila River near Calva	493	68	561	471	190
Frisco River at Clifton	226	60	286	381	105
Little Colorado at Lyman Reservoir (Jan-June)	9	37	45	383	9

1/ Provisional runoff provided by USGS and Salt River Project

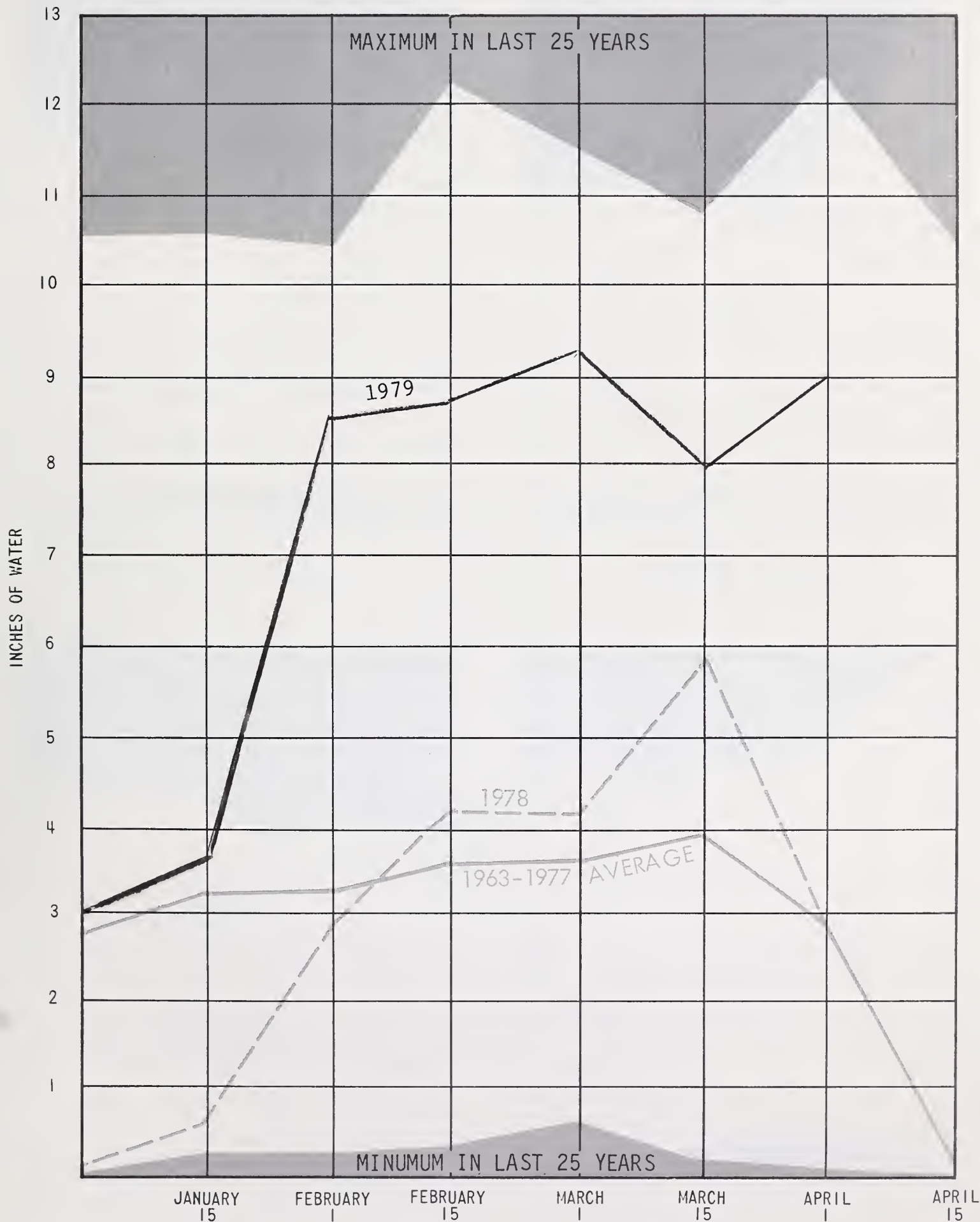
RESERVOIR STORAGE (Thousand Acre Feet) APRIL 1, 1979

BASIN or STREAM	RESERVOIR	Usable Capacity	Usable Storage		
			This Year	Last Year	Average†
<u>GILA RIVER DRAINAGE</u>					
Agua Fria	Lake Pleasant	157.6	157.6	157.6	78.6
Granite	Watson Lake	4.7	4.6	4.6	3.3
Granite	Willow Creek	6.1	6.1	6.1	2.9
Gila	San Carlos	1,073	1,033	276.4	261.3
Salt (4)	Roosevelt, Apache, Canyon & Saguaro	1,755	1,647.0	1,612.0	1,251.3
Verde (2)	Bartlett and Horseshoe	310.0	281.8	314.3	148.8
Salt and Verde	6 Salt River Project Reservoirs	2,065	1,928.8	1,926.3	1,400.1
<u>COLORADO RIVER DRAINAGE</u>					
Colorado	Lake Havasu	619.4	533.0	571.0	597.0
Colorado	Lake Mohave	1,810	1,659.0	1,618	1,667
Colorado	Lake Mead	26,159	23,080	21,281	17,302
Colorado	Lake Powell	25,002	16,000	14,528	10,069
Little Colorado	Lyman	30.6	15.6	8.6	16.9
Little Colorado	Show Low Lake	5.1	5.1	5.1	2.3
† Based on 15-year average, 1963-77					
* Average is for less than 15 years of record					

† Based on 15-year average, 1963-77

* Average is for less than 15 years of record

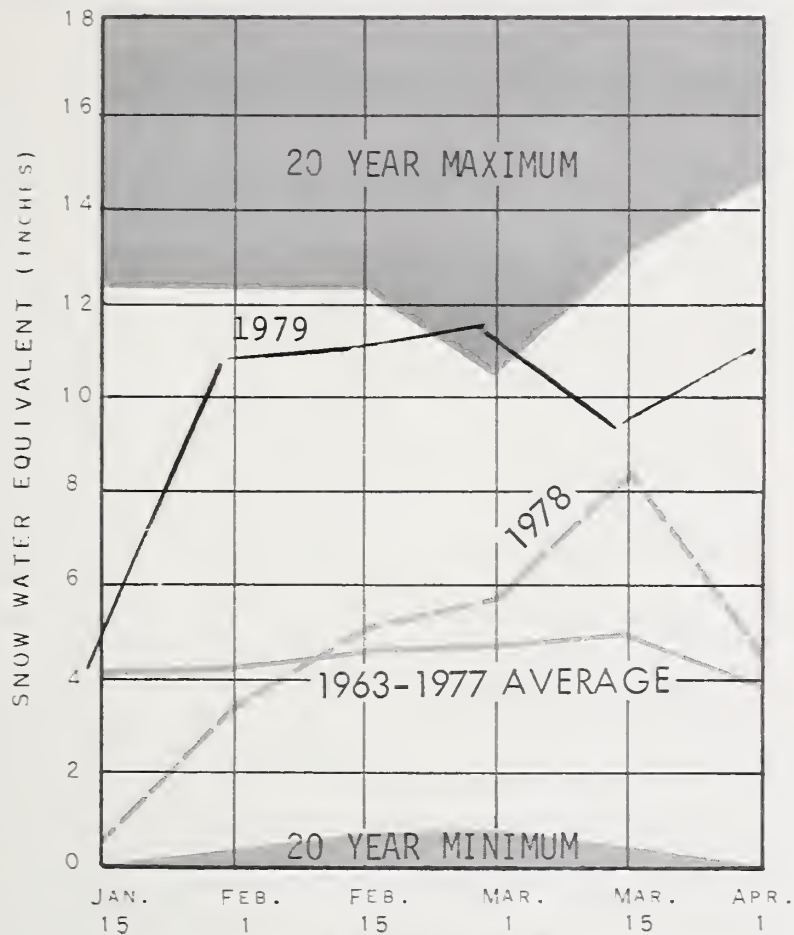
AVERAGE SNOW COVER ARIZONA 1979



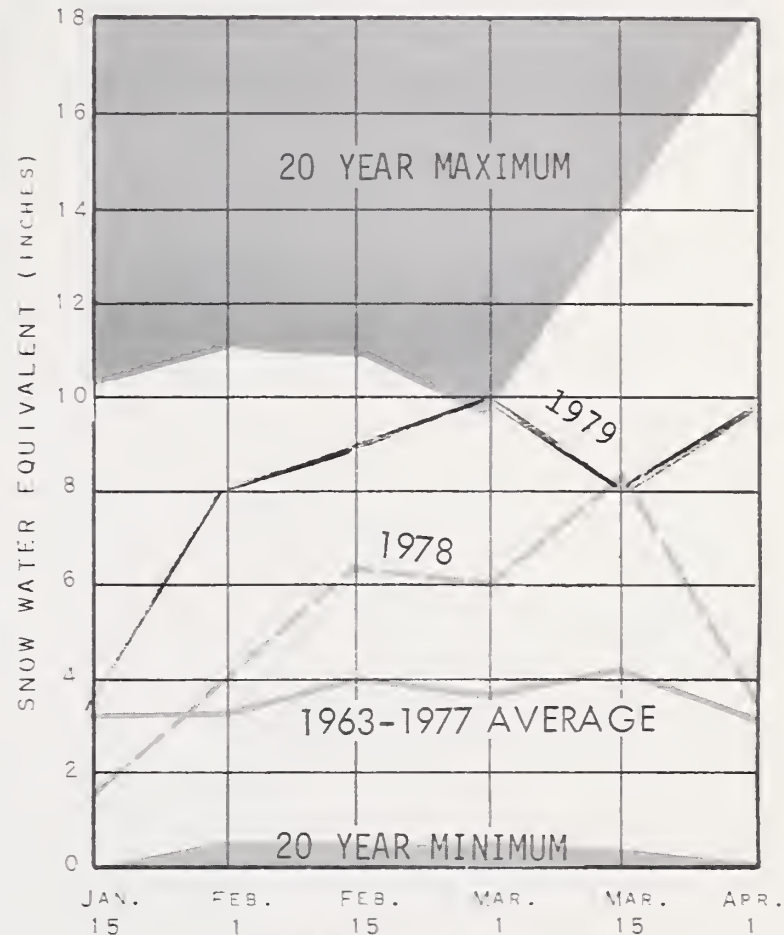
This graph represents the average snow water content on eleven selected snow courses on Arizona Sub-Watersheds.

1979

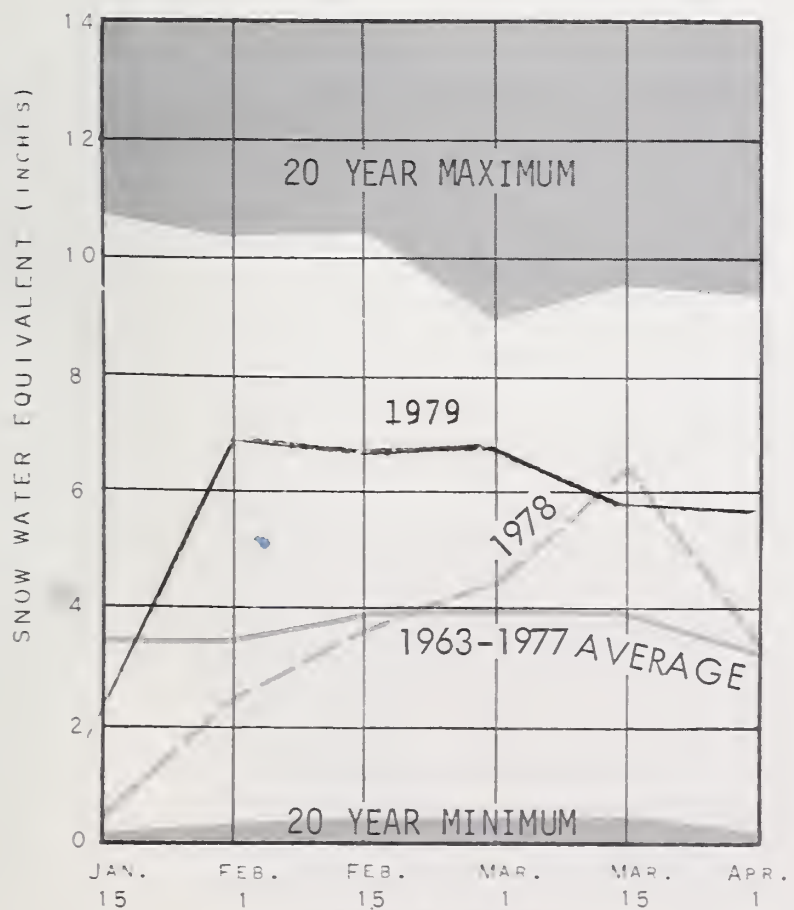
WATERSHED SNOW COVER



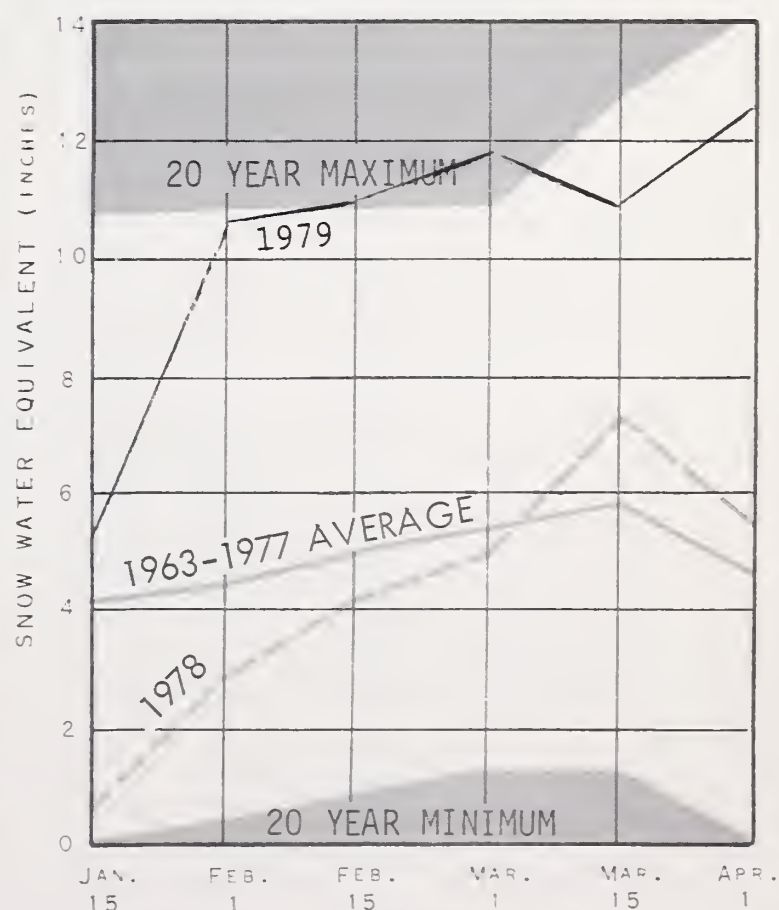
SALT RIVER



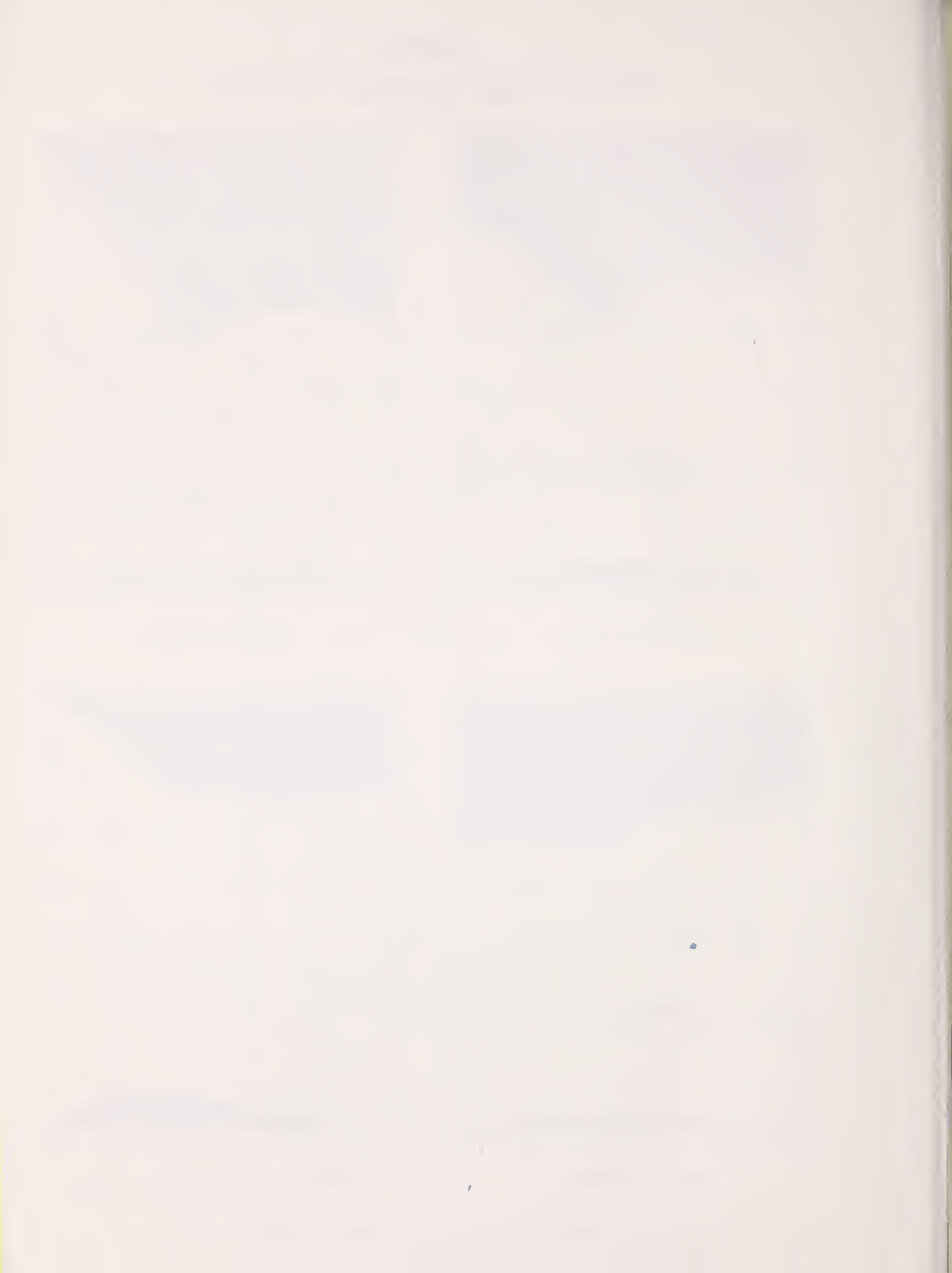
VERDE RIVER



GILA RIVER



LITTLE COLORADO RIVER



SUMMARY of SNOW MEASUREMENTS (COMPARISON WITH PREVIOUS YEARS) ABOUT APRIL 1, 1979

RIVER BASIN and or SUB-WATERSHED	Number of Courses Averaged	THIS YEAR'S SNOW WATER AS PERCENT OF.	
		Last Year	Average
Gila	10	190	188
Salt	10	273	285
Verde	10	287	294
Little Colorado	5	230	272



WATER SUPPLY INVENTORY SALT RIVER VALLEY SYSTEM

IN ACRE-FEET

AVERAGE SUPPLY
ON APRIL 1

3,000,000

ANTICIPATED
1979 SUPPLY

2,500,000

2,000,000

1,500,000

1,000,000

500,000

0

Unusable Portion
of Forecast Runoff

Usable Portion of
Forecast Runoff

Average Summer
Runoff

Present Storage

Average Spring
Runoff

Average Summer
Runoff

Average
Storage

Based on Present Storage + Forecast Spring Runoff + Average Summer Runoff



SNOW ABOUT APRIL 1, 1979

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Elevation				Last Year	Average †
<u>GILA RIVER</u>						
Bear Wallow	8100	3/30	29	12.2	0.5	2.8
Beaver Head	8000	3/30	14	5.7	0.0	1.6
Coronado Trail	8000	3/30	1	0.4	0.0	1.3
Emory Pass #1 *	7800	3/30	0	0.0	0.0	0.1**
Emory Pass #2 *	7800	3/30	0	0.0	0.0	0.3**
Frisco Divide	8000	3/30	7	1.8	0.0	0.9
Hannagan Meadows *	9090	3/30	54	19.0	9.7	8.4**
Hummingbird (A)	10550	3/30	78	29.3	16.7	15.7**
McKnight Cabin * (A)	9300	3/30	16	5.6	2.5	3.2**
Mogollon	7000	3/30	0	0.0	0.0	0.1
Nutrioso	8500	3/30	6	1.8	0.0	0.9
Redstone Trail	8600	3/30	33	11.8	7.9	6.5
Rose Canyon	7300	3/29	12	4.5	0.0	0.6
Silver Creek Divide	9000	3/30	44	16.1	13.5	10.4**
State Line	8000	3/30	7	2.4	0.0	1.1
Whitewater (A)	10750	3/30	98	35.3	26.1	20.6**
<u>VERDE RIVER</u>						
Baker Butte	7300	3/30	35	15.1	3.0	4.2**
Baker Butte #2	7700	3/30	70	27.5	19.0	10.2**
Camp Wood	5700	3/30	0	0.0	0.0	0.1
Chalender *	7100	3/30	19	6.8	0.0	1.6
Copper Basin Divide	6720	3/30	8	2.7	0.0	0.8
Fort Valley	7350	3/30	9	3.3	0.0	1.3
Gaddes Canyon	7600	3/30	45	12.0	5.8	4.7
Happy Jack	7630	3/30	26	9.0	0.4	2.3
Iron Springs *	6200	3/30	2	1.0	0.0	0.2
Mingus Mountain	7100	3/30	10	2.0	0.0	0.5
Mormon Lake *	7350	3/30	19	7.5	0.1	2.7
Mormon Mountain	7500	3/30	35	13.1	3.1	4.3
Newman Park	6750	3/30	4	1.8	0.0	1.3
Snow Bowl #1	10260	3/30	76	26.1	21.6	10.8
Snow Bowl #2	11000	3/30	119	38.6	28.0	18.6
White Horse Lake Jct.	7150	3/30	21	5.9	0.0	2.1**
White Spar	6000	3/30	2	0.4	0.0	0.2
<u>LOWER COLORADO RIVER</u>						
Bill Williams Intermediate	8550	N O	S U R V	E Y	19.0	8.6**
Bill Williams Summit	8950	N O	S U R V	E Y	23.7	11.6**
Chalender *	7100	3/30	19	6.8	0.0	1.6
Fort Valley	7350	3/30	9	3.3	0.0	1.3
Grand Canyon	7500	D E L A Y E D			0.0	1.1
Williams Ski Run	7720	3/30	55	17.6	14.8	7.8**

† 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted Average. (A) Aerial observation: water content estimated.

SNOW ABOUT APRIL 1, 1979

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Elevation				Last Year	Average †
<u>SALT RIVER</u>						
Baldy *	9125	3/30	53	18.2	7.7	6.0
Beaver Head	8000	3/30	14	5.7	0.0	1.6
Canyon Creek	7500	3/30	29	11.1	2.4	2.2
Canyon Point	7600	3/30	31	11.9	3.7	2.3**
Coronado Trail	8000	3/30	1	0.4	0.0	1.3
Forest Dale	6430	3/30	0	0.0	0.0	0.2
Ft. Apache	9160	3/30	51	17.3	6.1	6.3
Hannagan Meadows	9090	3/30	54	19.0	9.7	8.4**
Hawley Lake	8300	3/30	47	15.7	9.3	4.4**
Heber	7600	3/30	30	11.2	4.1	2.3
Maverick Fork	9050	3/30	63	23.1	12.6	7.6
McNary	7200	3/30	16	5.6	0.0	1.1
Milk Ranch	7000	3/30	8	2.3	0.0	0.7
Mt. Ord (A)	11000	3/30	171	51.3	37.4	26.7**
Nutrioso *	8500	3/30	6	1.8	0.0	0.9
Promontory Butte	7930	3/30	82	31.3	24.4	10.7**
Smith Cienega (A)	9850	3/30	117	39.8	26.0	20.9**
Sunrise Summit	10600	3/29	107	35.8	18.2	15.8**
Wilson Lake	9000	3/29	63	19.9	13.5	8.9**
Workman Creek	6900				0.0	3.2
<u>LITTLE COLORADO RIVER</u>						
Baldy	9125	3/30	53	18.2	7.7	6.0
Canyon Creek	7500	3/30	29	11.1	2.4	2.2
Canyon Point	7600	3/30	31	11.9	3.7	2.3**
Cheese Springs	8600	3/29	32	8.5	0.9	5.3**
Forest Dale	6430	3/30	0	0.0	0.0	0.2
Ft. Apache	9160	3/30	51	17.3	6.1	6.3
Fort Valley	7350	3/30	9	3.3	0.0	1.3
Happy Jack *	7630	3/30	26	9.0	0.4	2.3
Heber	7600	3/30	30	11.2	4.1	2.3
Lake Mary	6970	3/30	5	2.1	0.0	---
McNary	7200	3/30	16	5.6	0.0	1.1
Mormon Lake	7350	3/30	19	7.5	0.1	2.7
Mormon Mountain	7500	3/30	35	13.1	3.1	4.3
Nutrioso *	8500	3/30	6	1.8	0.0	0.9
Promontory Butte	7930	3/30	82	31.3	24.4	10.7**
Snow Bowl #1	10260	3/30	76	26.1	21.6	10.8
Snow Bowl #2	11000	3/30	119	38.6	28.0	18.6**
Wilson Lake	9000	3/29	63	19.9	13.5	8.9**
† 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted Average. (A) Aerial observation: water content estimated.						
Agassiz	11200	4/2	111	44.0	33.5	22.3**
Inner Basin #1	10000	4/2	107	43.3	29.5	18.2**
Inner Basin #2	9750	4/2	80	31.3	22.1	11.4**

SNOW ABOUT MARCH 15, 1979

DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (Inches)	
NAME	Elevation				Last Year	Average †
GILA RIVER						
Bear Wallow	8100	3/14	25	9.9	8.9	4.2
Beaver Head	8000	3/14	14	5.5	4.0	2.4
Coronado Trail	8000	3/14	2	0.9	7.7	2.4
Emory Pass #1 *	7800	3/15	0	0.0	0.0	0.5**
Emory Pass #2 *	7800	3/15	1	0.4	0.0	1.1**
Frisco Divide	8000	3/14	9	3.3	1.4	1.9
Hannagan Meadows *	9090	3/14	39	17.0	16.1	9.0**
Hummingbird (A)	10550	N O	S U R V E Y		15.0	16.3**
McKnight Cabin * (A)	9300	N O	S U R V E Y		9.5	3.5**
Mogollon	7000	3/14	0	0.0	0.0	0.4
Nutriosio	8500	3/15	7	2.7	2.2	1.5
Redstone Trail	8600	3/21	32	10.6	12.7	7.1
Rose Canyon	7300	3/14	12	4.5	2.6	1.9
Silver Creek Divide	9000	3/21	42	15.4	16.0	10.8**
State Line	8000	3/14	12	4.2	4.0	1.9
Whitewater (A)	10750	N O	S U R V E Y		24.0	19.7
Signal Peak	8360	3/20	17	8.0	---	---
VERDE RIVER						
Baker Butte	7300	3/14	28	11.7	11.1	6.0**
Baker Butte #2	7700	3/14	55	22.0	22.2	12.1**
Camp Wood	5700	3/14	0	0.0	0.0	0.4
Chalender *	7100	3/14	17	5.8	5.1	2.6
Copper Basin Divide	6720	3/14	5	1.9	1.9	1.6
Fort Valley	7350	3/14	10	4.1	6.6	2.0
Gaddes Canyon	7600	3/14	30	9.3	10.0	5.6
Happy Jack	7630	3/14	24	8.5	9.2	3.4
Iron Springs *	6200	3/14	0	0.0	1.4	0.4
Mingus Mountain	7100	3/14	0	0.0	0.1	0.9
Mormon Lake *	7350	3/14	20	7.4	6.7	4.2
Mormon Mountain	7500	3/14	30	11.8	12.1	5.8
Newman Park	6750	3/14	8	3.1	1.1	1.9
Snow Bowl #1	10260	3/14	60	21.5	20.8	10.2
Snow Bowl #2	11000	3/14	94	34.1	27.2	17.0**
White Horse Lake Jct.	7150	3/14	13	4.4	7.6	3.5
White Spar	6000	3/14	0	0.0	1.4	0.5
LOWER COLORADO RIVER						
Bill Williams Intermediate	8550	3/14	52	19.3	---	8.9**
Bill Williams Summit	8950	3/14	63	21.2	---	11.5**
Chalender *	7100	3/14	17	5.8	5.1	2.6
Fort Valley	7350	3/14	10	4.1	6.6	2.0
Grand Canyon	7500	3/14	30	9.3	6.1	1.4
Williams Ski Run	7720	3/14	41	13.8	17.8	8.0**

† 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted Average. (A) Aerial observation: water content estimated.

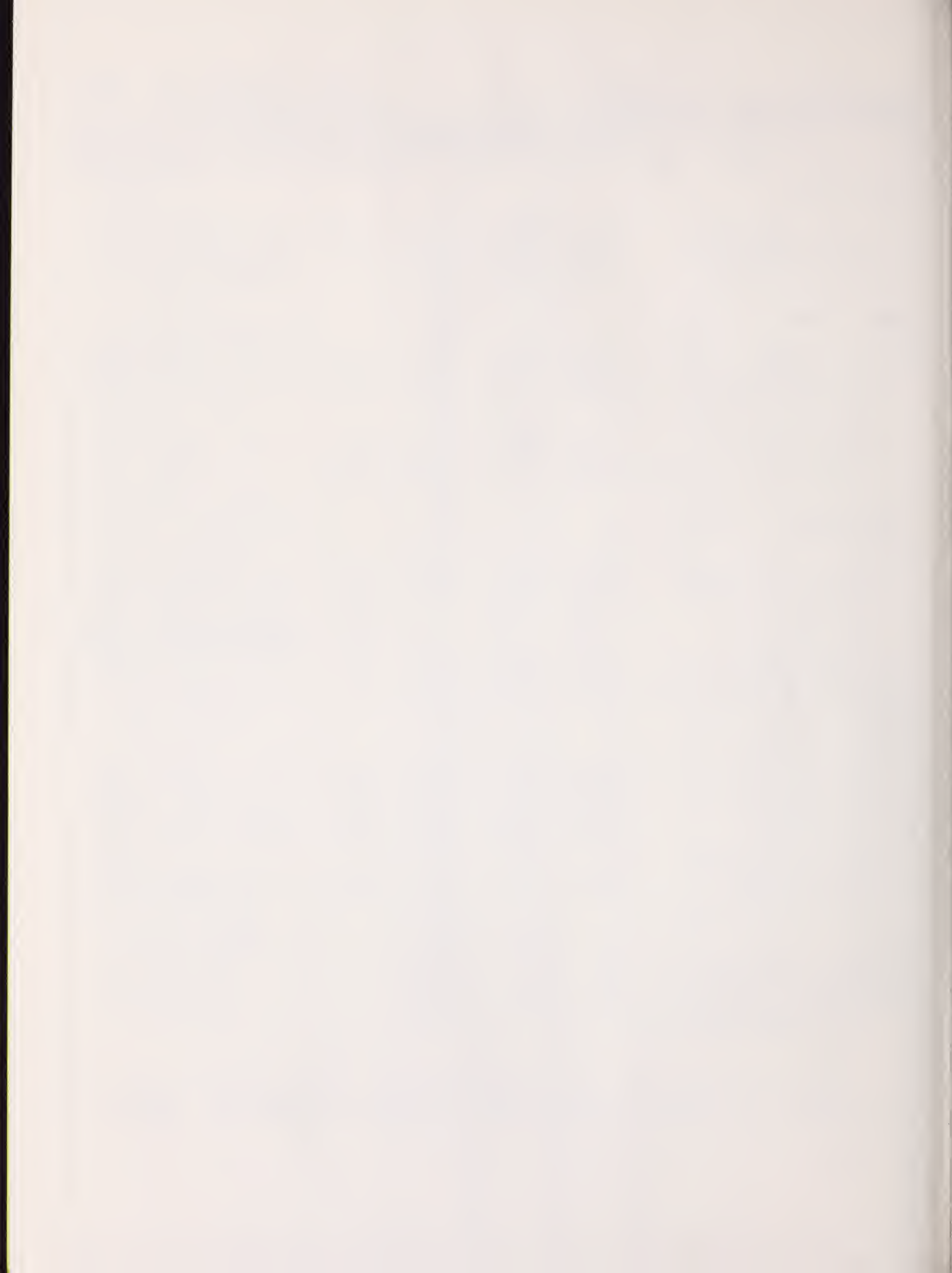
SNOW ABOUT MARCH 15, 1979

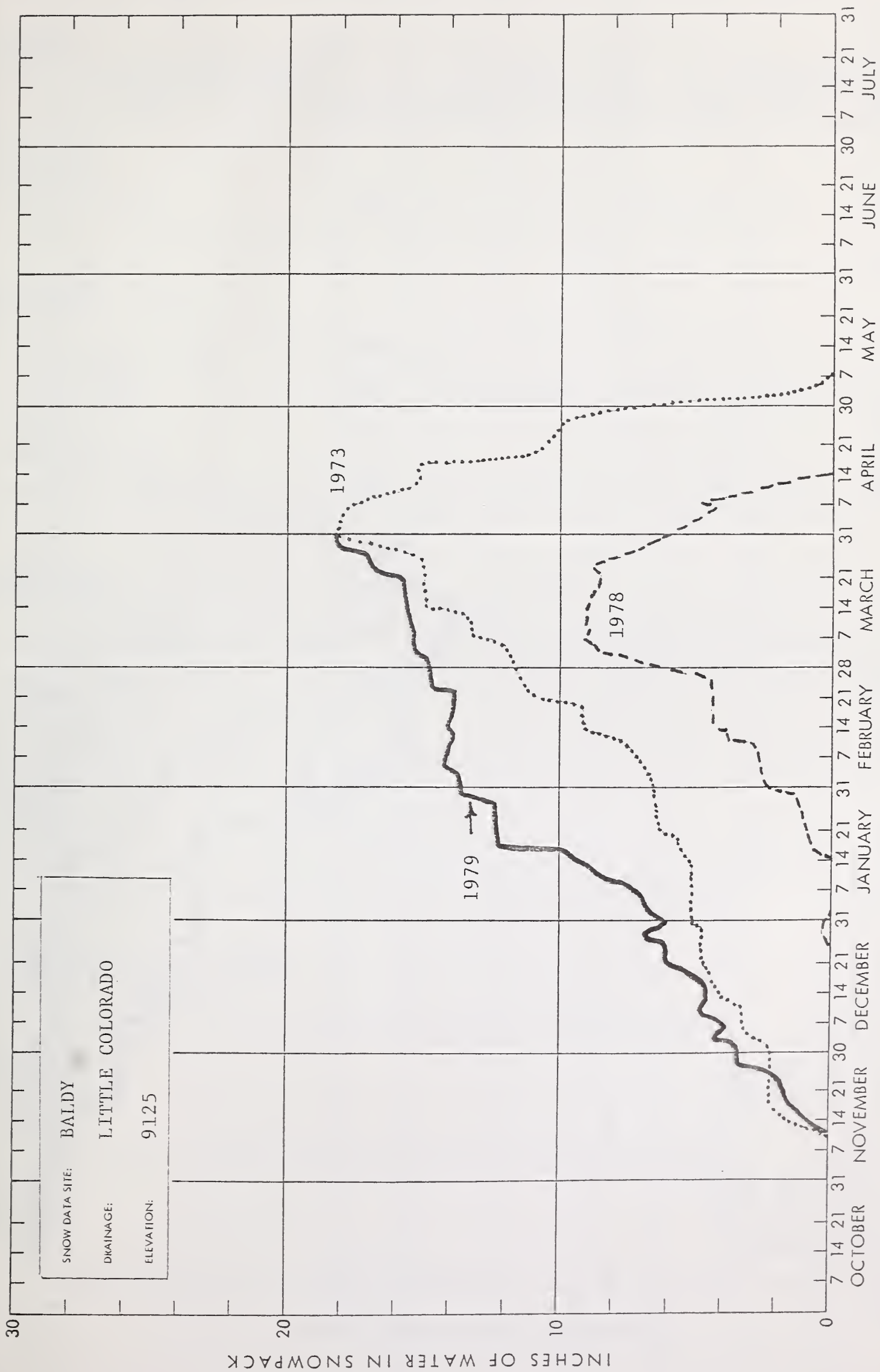
DRAINAGE BASIN and/or SNOW COURSE		THIS YEAR			PAST RECORD	
		Date of Survey	Snow Depth (Inches)	Water Content (Inches)	Water Content (inches)	
NAME	Elevation				Last Year	Average †
SALT RIVER						
Baldy *	9125	3/14	44	15.6	10.1	7.3
Beaver Head	8000	3/14	14	5.5	4.0	2.4
Canyon Creek	7500	3/14	19	7.6	10.1	3.5
Canyon Point	7600	3/14	21	8.5	14.6	4.3
Coronado Trail	8000	3/14	2	0.9	7.7	2.4
Forest Dale	6430	3/14	0	0.0	0.0	0.5
Ft. Apache	9160	3/14	44	14.4	8.7	7.8
Hannagan Meadows	9090	3/14	39	17.0	16.1	9.0**
Hawley Lake	8300	3/14	35	13.3	16.0	6.7**
Heber	7600	3/14	20	8.6	12.2E	3.8
Maverick Fork	9050	3/14	59	21.0	14.5	9.1
McNary	7200	3/14	13	5.3	1.6	2.0
Milk Ranch	7000	3/14	7	3.2	0.2	0.8
Mt. Ord (A)	11000	N O	S U R V E Y		---	---
Nutriososo *	8500	3/15	7	2.7	2.2	1.5
Promontory Butte	7930	3/14	61	23.2	28.3	12.7**
Smith Cienega (A)	9850	3/12	96	32.0	---	---
Sunrise Summit	10600	3/13	86	31.1	17.6	14.6**
Wilson Lake	9000	3/13	50	16.9	14.5	10.5**
Workman Creek	6900	3/14	21	8.5E	8.3	5.4
LITTLE COLORADO RIVER						
Baldy	9125	3/14	44	15.6	10.1	7.3
Canyon Creek	7500	3/14	19	7.6	10.1	3.5
Canyon Point	7600	3/14	21	8.5	14.6	3.9**
Cheese Springs	8600	3/13	27	8.5	6.9	6.9**
Forest Dale	6430	3/14	0	0.0	0.0	0.5
Ft. Apache	9160	3/15	44	14.4	8.7	7.8
Fort Valley	7350	3/14	10	4.1	6.6	2.0
Happy Jack *	7630	3/14	24	8.5	9.2	3.4
Heber	7600	3/14	20	8.6	12.2E	3.8
Lake Mary	6970	3/14	14	5.2	0.4	---
McNary	7200	3/14	13	5.3	1.6	2.0
Mormon Lake	7350	3/14	20	7.3	6.7	4.2
Mormon Mountain	7500	3/14	30	11.8	12.1	5.8
Nutriososo *	8500	3/15	7	2.7	2.2	1.5
Promontory Butte	7930	3/14	61	23.2	28.3	12.7**
Snow Bowl #1	10260	3/14	60	21.5	20.8	10.2
Snow Bowl #2	11000	3/14	94	34.1	27.2	17.0**
Wilson Lake	9000	3/14	50	16.9	14.5	

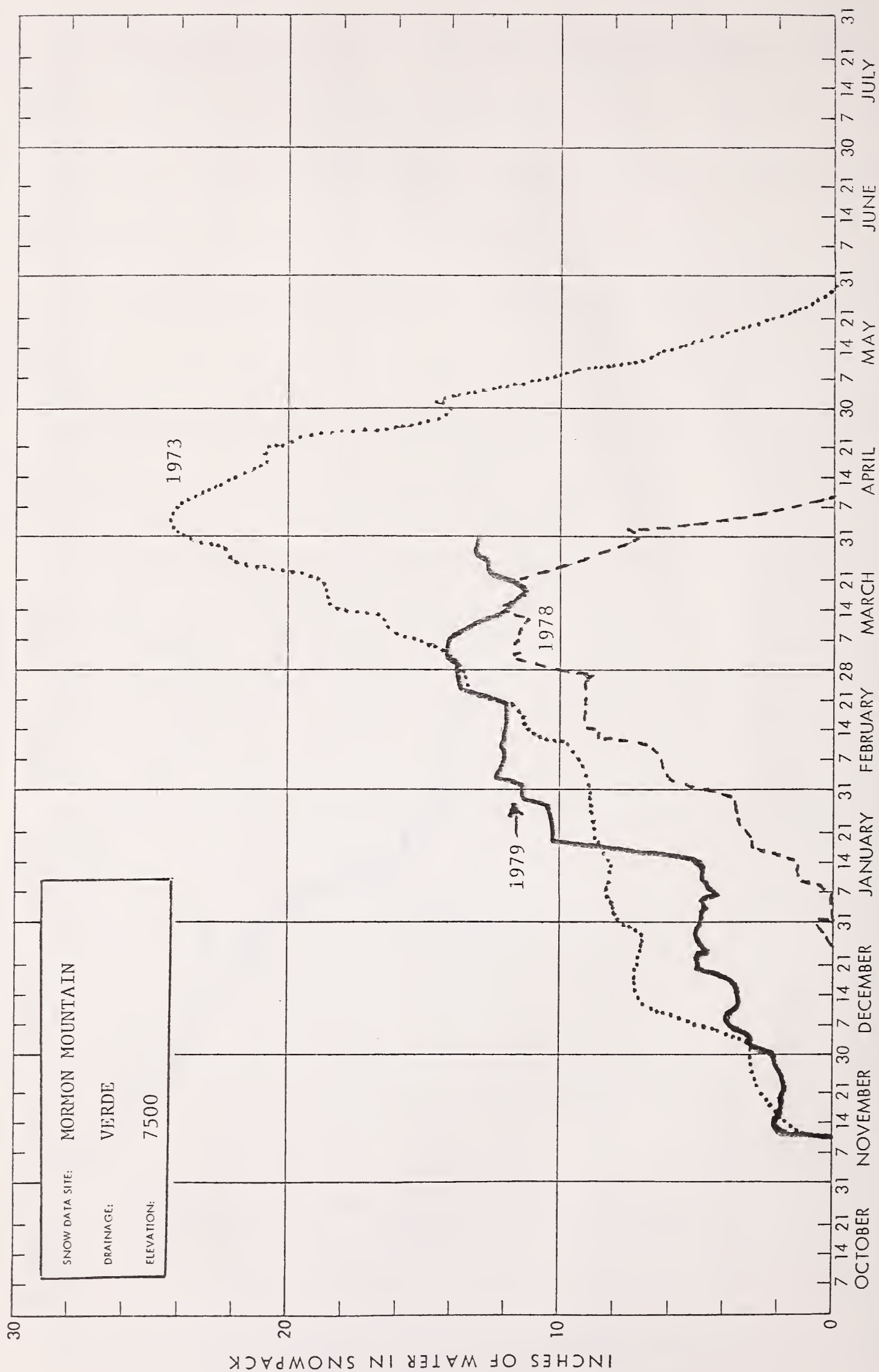
† 1963-77 15-year period. (*) Adjacent drainage. (**) 1963-77 Adjusted Average. (A) Aerial observation: water content estimated. E = estimated.

PRECIPITATION (Inches) ABOUT APRIL 1, 1979

DRAINAGE BASIN and PRECIPITATION GAGE LOCATION	ELEVATION	CURRENT INFORMATION			FROM APPROX. NOV. 1 TO DATE		
		Date of Reading	Month's Precipitation	Average †	This Year	Average †	Percent of Average
<u>GILA RIVER</u>							
Silver Creek Divide	9000	3/30	2.00	2.84*	32.00	13.35*	240
Hannagan Meadows **	9030	3/30	3.60	2.31	32.75	11.91	275
Frisco Divide **	8000	3/30	1.45	---	20.80	---	---
<u>SALT RIVER</u>							
Canyon Point	7600	3/30	6.87	3.82*	37.09	17.17*	216
Hannagan Meadows **	9030	3/30	3.60	2.31	32.75	11.91	275
Little Wildcat (Heber Snow Course)	7600	3/30	6.25	3.20	32.25	14.39	224
Maverick Fork	9050	3/30	4.39	2.59	31.58	12.47	253
Workman Creek **	6970	D E L A Y E D		3.50		16.69	
Wilson Lake	9100	3/29	4.40	3.18*	24.82	12.14*	204
<u>VERDE RIVER</u>							
Baker Butte	7300	3/30	6.42	3.45*	35.57	16.47*	216
Copper Basin Divide	6720	3/30	6.15	3.01	30.75	11.90	258
Fort Valley **	7350	3/30	2.67	2.20	15.95	8.86	180
Happy Jack **	7480	3/30	3.12	2.66	26.17	12.02	217
Mingus Mountain	7660	3/30	4.15	2.46	22.40	9.71	231
Mormon Mountain	7500	3/30	4.33	3.94	35.45	17.14	207
White Horse Lake Jct.**	7150	3/30	3.00	---	23.04	---	---
<u>LITTLE COLORADO</u>							
Inner Basin #1	9830	4/2	4.81	3.57	27.77	16.20	171
Inner Basin #2	10050	4/2	5.14	4.37	36.34	20.10	181
Greer Lakes	8500	3/30	1.80	1.41	14.20	6.41	222
Little Wildcat (Heber Snow Course)	7600	3/30	6.25	3.20	32.25	14.39	224
Sheep Crossing (Baldy Snow Course)	9125	3/30	4.55	2.61	27.42	11.48	239
† 1963-77 Average * Adjusted Average ** Data Supplied by U.S. Forest Service							







SOIL MOISTURE ABOUT APRIL 1, 1979

DRAINAGE BASIN and/or STATION		Profile (Inches)		Date of Survey	Soil Moisture (Inches)		
Name	Elevation	Depth	Capacity		This Year	Last Year	Average †
<u>GILA RIVER</u>							
Frisco Divide	8000	48	13.3	3/30	14.6	12.1	11.1
<u>SALT RIVER</u>							
Black River Divide	9100	48	16.8	3/30	18.4	16.0	17.6
Canyon Creek	7500	48	18.3	3/30	20.2	19.5	17.4
Corduroy Creek	6000	36	13.5	3/30	14.9	13.5	11.7
McNary	7200	48	16.3	3/30	17.9	17.9	16.6
<u>VERDE RIVER</u>							
Mormon Mountain	7500	48	16.1	3/30	17.8	17.8	17.4
Newman Park	6750	48	17.7	3/30	19.5	19.5	19.0

† 1963-77 15-year average

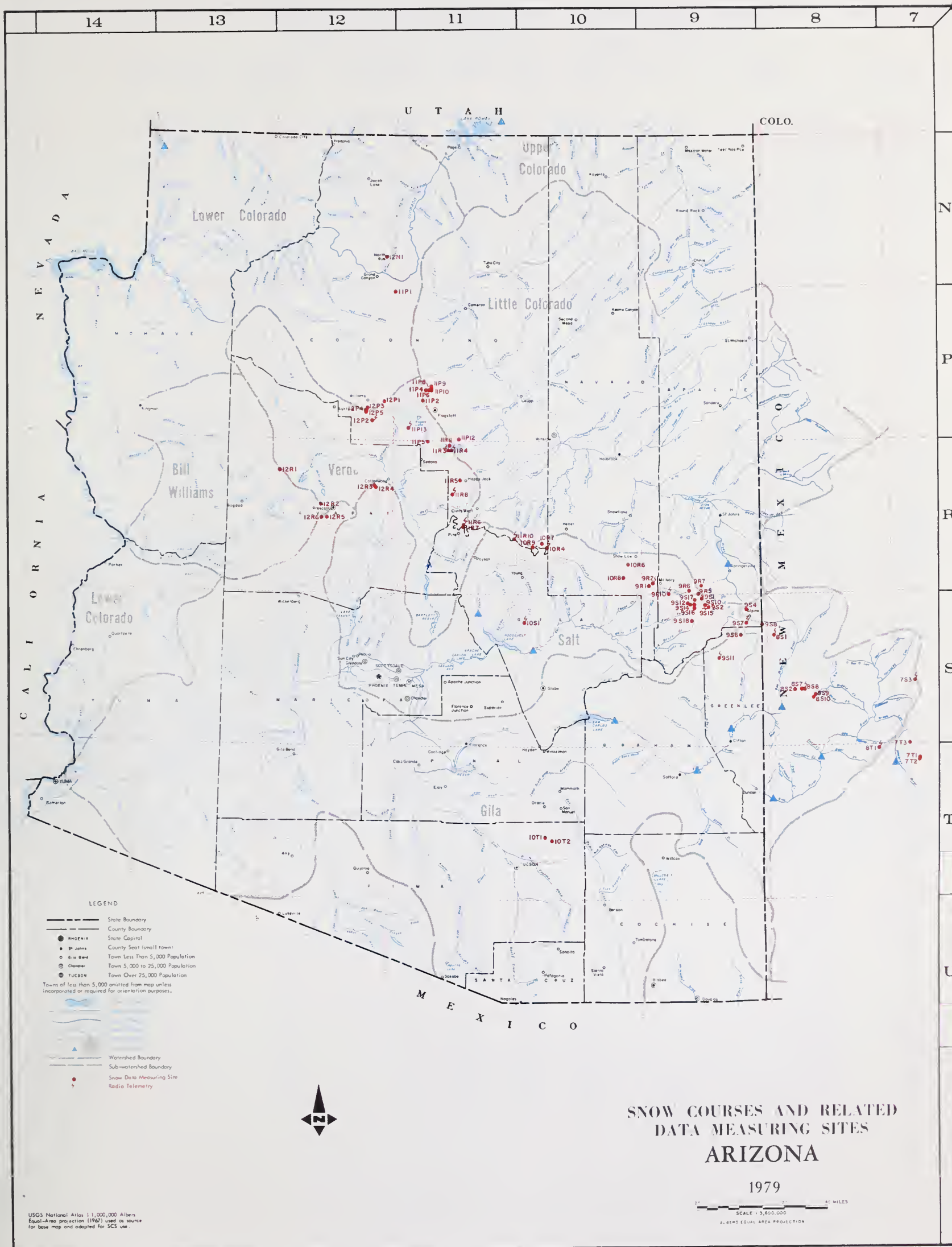
† 1963-77 15-year average



SNOW COURSE

SNOW SURVEYORS DURING 1979

Agassiz	SCS (Jorgensen and Munda) and City of Flagstaff (Talbot)
Baker Butte #1 & #2	SCS (Enz)
Baldy	SCS (Kyle and Lathrop)
Bear Wallow	Coronado National Forest (Dyess & Bryan)
Beaver Head	Apache-Sitgreaves National Forest (Bonomo & Woyewoozic)
Bill Williams Int.	Kaibab National Forest (Jones and Eddy)
Bill Wms. Summit	Kaibab National Forest (Jones and Eddy)
Bright Angel	National Park Service (Allison, Olson & Martinez)
Camp Wood	Prescott National Forest (K. Metzger)
Canyon Creek	SCS (Enz)
Canyon Point	SCS (Enz)
Chalender	Kaibab National Forest (Kramer and Bradley)
Cheese Springs	SCS (Kyle)
Copper Basin Divide	SCS (Geoff Parker)
Coronado Trail	Apache-Sitgreaves National Forest (Bonomo & Woyewoozic)
Emory Pass #1 & #2	SCS (Bray and Garcia)
Forest Dale	Bureau of Indian Affairs (Grippen and Endfield)
Ft. Apache	SCS (Kyle and Lathrop)
Ft. Valley	Rocky Mountain Forest & Range Experimental Station
Frisco Divide	Gila National Forest (Gibbons, Rael and Bustamante)
Gaddes Canyon	SCS (Earl Barto)
Grand Canyon	National Park Service (Stephan and Miller)
Hannagan Meadows	Apache-Sitgreaves National Forest (Bonomo & Woyewoozic)
Happy Jack	Coconino National Forest (Allred and Poleyquira)
Hawley Lake	Bureau of Indian Affairs (Grippen and Endfield)
Heber	SCS (Enz)
Hummingbird	SCS (Ewan and Alexander)
I.B. #1 (Bear Paw)	SCS (Munda) and City of Flagstaff (Talbot)
I.B. #2 (Snowslide)	SCS (Munda) and City of Flagstaff (Talbot)
Iron Springs	SCS (Geoff Parker)
Lake Mary	SCS (Jorgenson and Munda)
Maverick Fork	SCS (Kyle and Lathrop)
McKnight Cabin	SCS (Ewan)
McNary	Bureau of Indian Affairs (Grippen and Endfield)
Milk Ranch	Bureau of Indian Affairs (Grippen and Endfield)
Mingus Mountain	SCS (Earl Barto)
Mogollon	SCS (James Lyon)
Mormon Lake	SCS (Jorgensen and Munda)
Mormon Mountain	SCS (Jorgensen and Munda)
Mt. Ord	Salt River Project (Warskow)
Newman Park	SCS (Jorgensen and Munda)
Nutrioso	Apache-Sitgreaves National Forest (Bonomo & Woyewoozic)
Promontory Butte	SCS (Enz)
Redstone Trail	SCS (James Lyon)
Rose Canyon	Coronado National Forest (Dyess & Bryan)
Silver Creek Divide	SCS (James Lyon)
Smith Cienega	Salt River Project (Warskow)
Snow Bowl #1 & #2	Coconino National Forest (R. Hughes)
State Line	Gila National Forest (Gibbons, Rael and Bustamante)
Sunrise Summit	SCS (Kyle)
White Horse Lake Jct.	Kaibab National Forest (Jones and Eddy)
White Spar	SCS (Geoff Parker)
Whitewater	SCS (Ewan and Alexander)
Williams Ski Run	Kaibab National Forest (Jones and Eddy)
Wilson Lake	SCS (Kyle)
Workman Creek	Rocky Mountain Forest and Range Experimental Station



LEGEND

- State Boundary
- County Boundary
- State Capital
- County Seat (small town)
- Town Less Than 5,000 Population
- Town 5,000 to 25,000 Population
- Town Over 25,000 Population

Towns of less than 5,000 omitted from map unless incorporated or required for orientation purposes.

- Watershed Boundary
- Sub-watershed Boundary
- Snow Data Measuring Site
- Radio Telemetry

SNOW COURSES AND RELATED
DATA MEASURING SITES
ARIZONA

1979

SCALE 1:3,400,000
EQUIL-AREA PROJECTION

USGS National Atlas 1:1,000,000 Albers
Equal-Area projection (1967) used as source
for base map and adapted for SCS use.

INDEX to SNOW COURSES and SOIL MOISTURE STATIONS

NUMBER	NAME	SEC.	TWP.	RGE.	ELEV.	DRAINAGE	OBSERVER	RECORD BEGAN
11P10A	Agassiz	32	23N	7E	11200	Little Colorado	SCS-CF*	1968
11R7	Baker Butte #2	9	12N	9E	7700	Verde	SCS	1971
11R6PSPRT	Baker Butte	4	12N	9E	7300	Verde	SCS	1966
9S1APSPRT	Baldy	28	7N	27E	9125	Little Colorado	SCS	1950
9S15	Baldy #2	12	6N	26E	9750	Little Colorado	SCS	1963
9S16	Baldy #3	13	6N	26E	10950	Little Colorado	SCS	1963
10T1	Bear Wallow	6	12S	16E	8100	Gila	FS	1948
9S6	Beaver Head	13	4N	30E	8000	San Francisco	FS	1938
12P5	Bill William Intermediate	17	21N	2E	8550	Cataract	FS	1967
12P4	Bill Williams Summit	17	21N	2E	8950	Verde	FS	1967
9S10m	Black River Divide	10	6N	27E	9400	Salt	SCS	1954
9S18PSPRT	Bonito Rock		5N	26E	8270	Salt	SCS	1979
12N1	Bright Angel	34	33N	3E	8400	Bright Angel Creek	NPS	1947
12R1	Camp Wood	3	16N	6W	5700	Verde	FS	1946
10R7M	Canyon Creek #2	18	11N	15E	7500	Little Colorado	SCS	1958
10R9P	Canyon Point	28	11N	14E	7600	Salt	SCS	1967
12P1M	Chalender	27	22N	3E	7100	Verde	FS	1947
9R7	Cheese Springs	28	8N	27E	8600	Little Colorado	SCS	1969
12R6P	Copper Basin Divide	23	13N	3W	6720	Verde	SCS	1963
10R8m	Corduroy Creek	4	8N	21E	6000	Salt	SCS	1954
9S7PSPRT	Coronado Trail	26	5N	30E	8000	San Francisco	FS	1938
7T1	Emory Pass #1	16	16S	9W**	7800	Mimbres	SCS	1967
7T2	Emory Pass #2	16	16S	9W**	7800	Mimbres	SCS	1967
11P13PSPRT	Fry	35	20N	5E	7220	Verde	SCS	1978
10R6	Forest Dale	2	9N	21E	6430	Salt	BIA	1939
9R5	Ft. Apache	18	7N	27E	9160	Little Colorado	SCS	1951
11P2P	Ft. Valley	22	22N	6E	7350	Little Colorado	FS	1947
8S1MPSPRT	Frisco Divide	31	6S	20W**	8000	San Francisco	FS	1938
12R4	Gaddes Canyon	11	15N	2E	7600	Verde	SCS	1954
11P1	Grand Canyon	21	30N	4E	7500	Hance Creek	NPS	1947
9S11PSPRT	Hannagan Meadows	19	3N	29E	9090	San Francisco	FS	1964
11R5P	Happy Jack	30	16N	9E	7630	Verde	FS	1951
9R10PSPRT	Hawley Lake	13	7N	24E	8300	Salt	BIA	1966
10R4PSPRT	Heber	28	11N	15E	7600	Little Colorado	SCS	1950
8S9A	Hummingbird	19	11S	17W**	10550	Gila	SCS	1964
11P9P	Inner Basin #1	28	23N	7E	10000	Little Colorado	SCS	1967
11P8P	Inner Basin #2	28	23N	7E	9750	Little Colorado	SCS	1967
12R2	Iron Springs	22	14N	3W	6200	Little Colorado	SCS	1946
11P12	Lake Mary	21	19N	9E	6930	Little Colorado	SCS	1975
7S3PSPRT	Lookout Mountain	1	10S	10W	8500	Gila	SCS	1978
9S2APSPRT	Maverick Fork	13	6N	27E	9150	Salt	SCS	1950
7S3A	McKnight Cabin	10	15S	10W**	9300	Mimbres	SCS	1967
9R2MPSPRT	McNary	23	8N	23E	7200	Salt	BIA	1939
9R1	Milk Ranch	33	8N	23E	7000	Salt	BIA	1941
12R3	Mingus Mountain	3	15N	2E	7100	Verde	SCS	1947
8S2	Mogollon	2	11S	19W**	7000	San Francisco	SCS	1953
11R4	Mormon Lake	13	18N	8E	7350	Little Colorado	SCS	1947
11R3MAPSPRT	Mormon Mountain	14	18N	8E	7500	Verde	SCS	1950
11R11	Mormon Mountain Summit	2	18N	8E	8470	Little Colorado	SCS	1975
9S12A	Mt. Ord	4	6N	26E	11200	Salt	SRP-SCS	1966
11P5M	Newman Park	25	19N	6E	6750	Verde	SCS	1963
9S4	Nutriosio	23	6N	30E	8500	San Francisco	FS	1938
11R10PSPRT	Promontory Butte	5	11N	13E	7930	Little Colorado	SCS	1973
8S7	Redstone Trail	5	11S	18W**	8600	San Francisco	SCS	1961
10T2	Rose Canyon	15	12S	16E	7300	Gila	FS	1948
8T1PSPRT	Signal Peak	13	16S	13W	8360	Gila	SCS	1977
8S8PSPRT	Silver Creek Divide	4	11S	18W**	9000	San Francisco	SCS	1964
9S14A	Smith Cienega	10	6N	26E	10050	Salt	SRP-SCS	1966
11P4	Snow Bowl #1	36	23N	6E	10260	Verde	FS	1961
11P6	Snow Bowl #2	31	23N	7E	11000	Verde	FS	1965
9S8	State Line	6	6S	21W**	8000	San Francisco	FS	1938
9S17	Sunrise Summit	36	7N	26E	10600	Salt	SCS	1972
11R8PSPRT	Sugarloaf	8	8E	14N	6120	Verde	SCS	1978
12P2P	White Horse Lake Jct.	2	20N	2E	7180	Verde	FS	1967
12R5	White Spar	19	13N	2W	6000	Verde	SCS	1963
8S10A	Whitewater	19	11S	17W**	10750	Gila	SCS	1964
12P3	Williams Ski Run	9	21N	2E	7720	Cataract	FS	1967
9R6P	Wilson Lake	4	7N	26E	9000	Salt	SCS	1966
10S1PSPRT	Workman Creek	33	6N	14E	6900	Salt	FS	1952

A Aerial Snow Depth Marker
M Soil Moisture Station
M Soil Moisture Station Only
P Precipitation Storage Gage
R Radio Telemetry

SP Snow Pressure Pillow
T Temperature
** NM Principal Meridian
* City of Flagstaff

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PROCUREMENT SECTION
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water supply for irrigation,
domestic and municipal water
supply, hydro-electric power
generation, navigation,
mining and industry

*"The Conservation of Water begins
with the Snow Survey"*